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COMMENT

Learning with the COVID-19 pandemic mistakes: Facing the progression of the first cases of Monkeypox in Brazil

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An ongoing outbreak of Monkeypox, a viral disease, was confirmed in May 2022, during the occurrence of the most important pandemic of the 21st century, namely, Coronavirus Disease (COVID)-19. According to the literature, Monkeypox does not have the potential to cause the same impact as COVID-19 in terms of the number of people infected and deaths.¹ However, the increase in the number of Monkeypox cases is a wakeup call to Health Authorities, and it is essential to take measures to control viral dissemination. Although Monkeypox is endemic and was first reported in Central and West Africa,² there was a deport of a previous outbreak outside Africa in 2003.³ The United Kingdom, Singapore, and Israel also reported cases of Monkeypox among individuals returning from Nigeria.⁴ This novel outbreak was also first described in the United Kingdom by a patient who came from Nigeria on May 07, 2022.^{5,6}

In Brazil, the first case of Monkeypox was diagnosed on June 08, 2022. According to the last Pan American Health Organization, on August 17, 2022, the American continent accounted for nearly 48% of the total Monkeypox cases, the most affected countries being the United States of America (12,743 cases), Brazil (3,184 cases), Canada (1,091 cases),

and Peru (867 cases), with nearly 96% of the total American confirmed cases.⁷ Up to now, Brazil has accounted for approximately four thousand cases and only one death.

In this context, we performed the first Brazilian data collection of Monkeypox⁸ and COVID-19⁹ cases in Brazil from the Our World in Data Website. In our data search, we collected information on the number of Monkeypox and COVID-19 cases. We also summarized the number of deaths due to COVID-19. The Monkeypox cases were registered from June 08, 2022, to August 25, 2022; and the COVID-19 were registered from the same period (simultaneous disease progression) and from February 26, 2020, to May 14, 2020 (progression of both diseases after the first diagnostic case) (Fig. 1a to d; and Supplementary Fig. 1a to d). We also calculated the proportion of COVID-19 cases and deaths per Monkeypox cases (Fig. 1e and f).

In our data, we observed that the COVID-19 pandemic in Brazil presented a higher transmission rate (~50x after 79 days of the first case of both diseases, Fig. 1e) than the Monkeypox viral infection, indicating that the new emergent infection has a lower potential for dissemination compared to the COVID-19, at least in this early stage. Also, to date, the number of deaths due to COVID-19 was ~3x higher than the number of Monkeypox cases in Brazil (Fig. 1f). Although Brazil built several diverse molecular biology and sequencing laboratories that can perform real-time polymerase chain reaction (RT-PCR) to identify the Monkeypox virus, we should be careful not to make the same mistakes as in the COVID-19 pandemic where we observe intensive cross-infection, mainly associated with a high COVID-19 underdiagnosis in Brazil, thus harming public health measures.^{10–12} Also, the

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onset of COVID-19 in Brazil was associated with a collapse in the Health System, causing high case fatality rates, as can be observed in the present study (Fig. 1d).

Although Monkeypox appears not to have the same pandemic potential as the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection, it already comprises more than 46,000 total cases on August 25, 2022, in several places where Monkeypox is not common, such as the United States of America, the United Kingdom, and several other European countries.¹³ Curiously, on August 25, 2022, the United States of America accounted for more than 35% of the total cases worldwide (46,679 cases with 49.96 cases per million inhabitants). In contrast, Brazil accounts for nearly 8.5% (16,837 cases with 19.67 cases per million inhabitants) of total cases.¹³ In addition, there have been 13 deaths due to Monkeypox in the world, one in Brazil as described above. The increase in Monkeypox cases might be explained by decreased population immunity against

smallpox since that was eradicated and vaccinations stopped nearly 30 years ago; and due to new transmission patterns, which might increase the Monkeypox spread in the world.⁵

Although Monkeypox has been reported in several countries, its clinical presentation might differ. Perhaps one of the most significant differences may be related to skin lesions. The African skin lesions are more predictable than the American ones since the lesions have macule-papule-pustule evolution, which desquamates in 14 to 21 days, leaving a varioliform scarring;^{14,15} in contrast, the American skin lesions vary their morphology from person to person, even among infected people from the same family,^{15,16} in that the lesions have a papule-vesicle-pustule evolution, with erythematous flares, which are not reported in African cases.¹⁵

Even though the COVID-19 pandemic and the Monkeypox outbreak present some similar challenges, such as preconceptions against those who are most affected, the need for an efficient testing public policy, and the difficulty of clinical

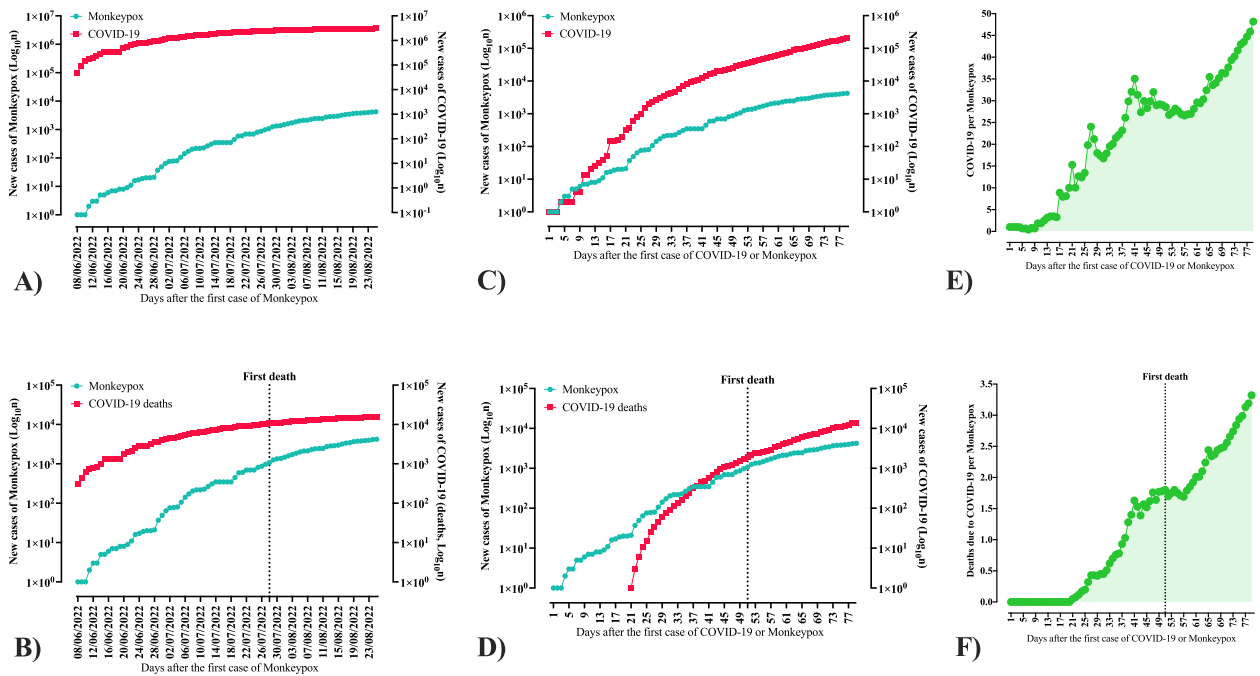


Fig. 1 Monkeypox and Coronavirus Disease (COVID)-19 disease progression in Brazil. We presented the cumulative number of new cases for both diseases (Monkeypox and COVID-19) per day and the cumulative number of new deaths due to COVID-19 per day. **A)** The cumulative number of new Monkeypox cases vs. the cumulative number of new cases of COVID-19 considering the period after the diagnosis of the first case of Monkeypox in Brazil. **B)** The cumulative number of new Monkeypox cases vs. the cumulative number of new deaths due to COVID-19 considering the period after the diagnosis of the first case of Monkeypox in Brazil. **C)** The cumulative number of new Monkeypox cases considering the period after the diagnosis of the first case of Monkeypox in Brazil vs. the cumulative number of new cases of COVID-19 considering the period after the diagnosis of the first case of COVID-19 in Brazil. **D)** The cumulative number of new Monkeypox cases considering the period after the diagnosis of the first case of Monkeypox in Brazil vs. the cumulative number of new deaths due to COVID-19 considering the period after the diagnosis of the first case of COVID-19 in Brazil. **E)** Proportion of new COVID-19 cases per new Monkeypox cases for the progression of both diseases after the diagnosis of the first case for both diseases – we calculated the proportion using the cumulative number of cases. **F)** Proportion of new deaths due to COVID-19 per new Monkeypox cases for the progression of both diseases after the diagnosis of the first case for both diseases – we calculated the proportion using the cumulative number of cases. We adjusted the y-axis (left – Monkeypox and right – COVID-19) using the Log₁₀ scale to present our data in Fig. 1A to D with the units. We presented the x-axis as data for Fig. 1A and B, and as days after the first case for Fig. 1C to F. In Fig. 1C, D, and F, we marked the day where the first death due to Monkeypox in Brazil occurred. We retrieved the data from Our World in Data.^{8,9} The Monkeypox cases were registered from June 08, 2022, to August 25, 2022; and the COVID-19 were registered from the same period (simultaneous disease progression) and from February 26, 2020, to May 14, 2020 (progression of both diseases after the first diagnostic case).

management of a little-known disease,¹⁷ there might be some room for optimism, since there are treatments and vaccinations available, even though not fully available for countries in Latin America. In addition, the Smallpox vaccine appears to confer nearly 85% protection against Monkeypox.^{18–20}

However, one fact needs to be called to attention; we observed a constant increase in the number of cases of Monkeypox while the number of new cases of COVID-19 is stagnating in Brazil. Furthermore, it is difficult to discuss the impact of the new Monkeypox in Brazil, even in more susceptible individuals, such as Indigenous peoples, Black/*Pardos* (multiracial background), and older individuals, when compared with COVID-19, which caused a significant impact in our country, since the disease onset was reported two years later.²¹ Also, in a recent report, nearly 41% of the individuals with Monkeypox had Human Immunodeficiency Virus (HIV) infection, which could be a problem for Latin America, especially Brazil, since we have a high prevalence of people living with HIV.²²

Curiously, after the COVID-19 pandemic, the Latin-American countries are better prepared to confront a new possible pandemic, such as the Monkeypox disease outbreak as described by Rodriguez-Morales and collaborators, as well as Cimerman and collaborators. They discussed the importance of optimizing genetic testing to identify the viral agent, which was improved during COVID-19, and also strengthening surveillance systems.^{10,23} For example, the first case of the Monkeypox virus in Brazil was sequenced and published using shotgun metagenomic sequencing days after the clinical suspicion.²⁴ However, we should approach the Monkeypox threat carefully in developing countries, such as those in Latin America, since although experimental drugs, such as Cidofovir and Tecovirimat, have proven efficacy, and vaccines for contacts of positive cases have been implemented,²³ not only might the high prices of these inputs not be affordable for Latin America countries, but also they may not be available, which could enhance the Monkeypox threat.

Brazil is, fortunately, better prepared at least to diagnose Monkeypox compared to the COVID-19 diagnosis at the onset of the pandemic, mainly in the first wave, and it also has a strengthened surveillance system. Monkeypox does not have the same capacity to be a new pandemic compared with COVID-19, with low chances of infecting new individuals and causing deaths, as we present in our data (Fig. 1e and f).

However, we are in the early stages of this outbreak and have limited information about the Monkeypox disease progression in Brazil and the world. In addition, there is no evidence about the impact of the new viral infection among those with COVID-19 and susceptible individuals, which is alarming in Brazil, where several groups deserve special attention, such as the Indigenous peoples and those living with HIV. Countries around the world should learn from the Brazilian mistakes in the management of a pandemic, such as the COVID-19 ones.²⁵ Although Monkeypox appears not to have the same dissemination potential, public health policies should be adopted, such as a proper testing policy, implementation of vaccination, proper clinical management, self-isolation, when necessary, using only scientific data to guide public health policies, and even the investment in new antivirals to treat Monkeypox, in order to

decrease the spread and lethality of Monkeypox, avoiding a new “COVID-19 crisis”.

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Ethics approval

The data used in our study were made publicly available, not containing consent-free personal data since it does not present risks to the research participants.

Consent to participate

Not required.

Consent for publication

The authors have approved the manuscript and agreed with the submission.

Data and material availability

We accessed the complete data in Our World in Data (<https://ourworldindata.org/>).

Code availability

Not required.

Authors' contributions

(FALM) made substantial contributions to the study conception and design; and performed the acquisition, analysis, and interpretation of data for the work. (MNB, CVCP, and FALM) drafted the work and revised it critically for important intellectual content. (MNB, CVCP, and FALM) gave the final approval for the version to be published.

Conflicts of interest

Not required.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.pulmoe.2022.08.007](https://doi.org/10.1016/j.pulmoe.2022.08.007).

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